MISSOURI MONTHLY VITAL STATISTICS

Provisional Statistics
From The

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Focus...Preterm Births by Race and Age of Mother

Preterm births, like other poor pregnancy outcome indicators, have a higher rate of occurrence for Non-Hispanic Black (NH-Black) than Non-Hispanic White (NH-White) mothers.[1,2] The present study will review how risk factors/ markers relate to the racial disparity in preterm births across age groups.

The study population consists of all 1995-2000 Missouri resident singleton live births born in Missouri non-military hospitals for mother's race groups of NH-Black and NH-White. Only singletons were included because of the high preterm rate (56.3 percent) associated with multi-fetal births (e.g. twins). Other race/ethnic groups were excluded because of small numbers (for 1995-2000 Missouri residents recorded in Missouri non-military hospitals 2.4 percent of all live births are other races and 2.5 percent are of Hispanic origin which can be of any race). The linked patient abstract (mother's hospital record)/birth certificate data set was used to acquire more complete reporting of medical and behavioral factors related to preterm births.

Table 1 shows preterm rates with crude and adjusted relative risk (RR) for available factors related to preterm births. The adjusted RRs for preterm births were derived from a logistic regression model with all the factors listed in Table 1 in the model as the crude RR for all the factors were significant. The highest crude RRs for preterm birth were noted for medical risk, illegal drugs (i.e., cocaine, marijuana and heroin), NH-Black and not married. After adjusting for all the noted factors, the highest RRs for preterm birth were noted for medical risk, NH-Black, spacing less than 18 months between births and illegal drugs. Adjusted RRs were significantly high for all factors in the model except for Medicaid participation during pregnancy, which was significantly low. One explanation for this may be that entry into Medicaid could be, on average, late in pregnancy so that those likely to have preterm births already have done so. This result could also be because Medicaid participation is primarily related to the other reviewed factors and that participation by itself does not affect preterm rates. Or, alternatively, Medicaid participation may improve the outcome.

Table 2 shows how the incidences of risk factors/ markers for preterm births vary by age and race of mother. Some factors (i.e., fourth plus births, not married, no first trimester prenatal care and medical risk {See footnote Table 1 for which medical conditions are included.}) were statistically significantly higher for NH-Blacks than NH-Whites regardless of age of mother. NH-Blacks are more likely than NH-Whites to have four or more births regardless of age and this difference is greatest for the youngest age groups. For both race groups the percent of births born out of wedlock decreases with increasing age until ages 30-34 and then

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Table 1. Preterm Birth Rates with Crude and Adjusted Relative Risk by Selected Factors: 1995-2000 Missouri Resident Singleton Live Births Recorded in Missouri Non-Military Hospitals

	Preterm Births	Percent	Crude Relative Risk	Crude 95% CL	Adjusted Relative Risk	Adjusted 95% CL
NH-Black	9,729	15.4	2.04	1.99-2.08	1.60	1.55-1.65
First born	14,963	9.2	1.07	1.04-1.09	1.03	1.04-1.07
4 or more prior births	4,591	11.7	1.38	1.34-1.42	1.28	1.21-1.36
Not married	16,671	12.3	1.74	1.70-1-77	1.24	1.20-1.28
Education < 12 years	9,091	12.2	1.51	1.48-1.54	1.09	1.05-1.12
Medicaid	17,391	10.8	1.43	1.40-1.46	0.95	0.92-0.98
Spacing < 18 months	3,052	12.8	1.50	1.45-1.55	1.50	1.43-1.56
Under weight*	6,035	10.4	1.24	1.21-1.28	1.34	1.30-1.38
Smoke during preg	8,928	11.0	1.33	1.30-1.37	1.22	1.18-1.25
Illegal drugs	1,325	21.6	2.50	2.38-2.62	1.49	1.39-1.60
No 1st trimester care	7,040	13.7	1.69	1.65-1.73	1.34	1.29-1.38
Medical risk**	21,930	15.6	3.06	3.00-3.12	3.06	2.98-3.13
Cesarean Se section	9,760	12.0	1.50	1.47-1.53	1.34	1.30-1.37
Age less than 18	2,732	13.7	1.59	1.53-1.65	1.22	1.15-1.30
Age 40 or over	740	12.4	1.41	1.32-1.51	1.47	1.35-1.61
Male gender	18,736	9.2	1.10	1.08-1.12	1.09	1.07-1.12

95% CL - 95% Confidence Level

*Under weight defined as: body mass index less than 19.8.

**Medical risk includes: anemia, cardiac disease, acute or chronic lung disease, insulin dependent diabetes, hydramnios/oligohydramnios, hemoglobinopathy, chronic hypertension, pregnancy-induced hypertension, eclampsia, incompetent cervix, previous preterm or small for gestational age infant, renal disease, uterine bleeding, premature rupture of membranes > 12 hours, abruptio placenta, placenta previa, other excessive bleeding, fetal distress

increases slightly. At the lowest level of out of wedlock births, ages 30-34, over half of NH-Black births are born out of wedlock versus one in eleven for NH-Whites. Births to mothers with no first trimester prenatal care decrease with increasing age up to 30-34 and then increase with age for both race groups. The NH-Black no first trimester care rate at its lowest point (ages 30-34) is still 3.4 times greater than the corresponding rate for NH-Whites. The percent of NH-Black births noting one or more medical pregnancy risk factors decreased with increasing age up to ages 25-29 when it reached a low of 47.8 percent and then increased to 62.2 percent for ages 40 and over. The corresponding pattern for NH-Whites showed a decrease in medical risk factors with increasing age up to ages 30-34 for a low of 30.1 percent and then an increase with increasing age to 38.9 percent for ages 40 and over.

Having a first-born child and underweight for height (BMI < 19.8, body mass index - weight in kilograms divided by height in meters squared) were the only factors that were noted as lower for NH-Blacks than NH-Whites regardless of age. For both race groups the percent of mothers having their first child and those underweight decreases with increasing age.

NH-Black mothers were less likely to smoke during pregnancy than NH-White mothers prior to the age of 30 but at that age and older the reverse holds. For NH-Blacks smoking increased with age and for NH-Whites smoking during pregnancy

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Table 2: Prevalence* of Selected Risk Factors for Preterm Births by Mothers Race and Age: 1995-2000 Missouri Resident Singleton Live Births Recorded in Missouri Non-Military Hospitals

		Mothers Age								
		10 to 17	18 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 Plus	All Ages	Total with Condition
First born	NH-Black	86.2	63.0	33.9	22.0	19.4	16.6	14.9	38.1	24,008
First born	NH-White	**93.5**	**78.2**	**48.8**	**38.7**	**25.9**	**19.9**	**18.5**	**41.8**	139,134
4th born plus	NH-Black	**0.15**	**1.7**	**13.6**	**25.6**	**30.9**	**37.2**	**44.0**	**16.9**	10,674
4th born plus	NH-White	0.02	0.3	3.7	7.4	12.8	22.5	34.0	8.6	28,511
Not married	NH-Black	**99.4**	**96.6**	**86.8**	**65.4**	**52.8**	**53.0**	**53.9**	**78.3**	49,337
Not married	NH-White	85.1	66.7	37.7	14.6	9.1	10.4	12.7	26.1	86,710
Educ < 12 yrs	NH-Black	90.0	43.8	**26.6**	**15.0**	**11.9**	**12.0**	**13.4**	**30.6**	19,274
Educ < 12 yrs	NH-White	89.2	44.8	21.6	7.8	4.7	4.9	5.3	16.7	55,469
Medicaid	NH-Black	77.2	**83.7**	**79.7**	**57.2**	**43.3**	**40.9**	**41.7**	**67.9**	42,772
Medicaid	NH-White	77.7	80.9	57.4	23.4	13.1	12.7	15.2	35.7	118,848
Spac <18 mos	NH-Black	41.2	27.4	**17.7**	**10.1**	**8.5**	**7.4**	4.5	**14.6**	5,216
Spac <18 mos	NH-White	**46.8**	**32.7**	15.6	8.3	6.2	5.1	3.8	9.8	18,545
Under Weight	NH-Black	18.2	15.1	12.0	8.2	7.6	6.0	5.9	11.3	6,715
Under Weight	NH-White	**31.9**	**25.4**	**18.0**	**13.5**	**12.3**	**10.6**	**9.0**	**15.8**	51,128
Smoking dur pg	NH-Black	6.8	10.3	12.4	13.4	**20.3**	**26.1**	**21.6**	13.6	8,583
Smoking dur pg	NH-White	**33.5**	**34.5**	**28.8**	**17.4**	14.7	16.7	15.9	**21.7**	72,293
Illegal drugs	NH-Black	2.1	**3.0**	**3.2**	**5.2**	**8.9**	**10.7**	**10.4**	**4.7**	2,970
Illegal drugs	NH-White	1.8	1.6	1.3	0.7	0.6	0.7	0.8	1.0	3,173
No 1st Tri care	NH-Black	**38.3**	**27.9**	**24.0**	**19.3**	**19.2**	**22.2**	**26.8**	**24.4**	15,391
No 1st Tri care	NH-White	28.0	21.1	14.5	7.3	5.7	7.1	10.2	10.8	36,016
Medical risk**	NH-Black	**52.7**	**51.6**	**48.6**	**47.8**	**49.1**	**55.2**	**62.2**	**49.9**	31,421
Medical risk**	NH-White	36.0	36.0	34.1	31.6	30.1	33.2	38.9	32.7	108,912
Cesarean sec	NH-Black	13.0	14.2	15.7	20.2	**25.8**	**30.4**	34.1	18.5	11,659
Cesarean sec	NH-White	13.8	**15.5**	**18.2**	21.0	23.7	27.8	31.5	**20.9**	69,608

*per 100 live births per given age grouping.
**See bottom table 1 for listing of conditions covered under medical risk.
Bold values are statistically significantly higher than the corresponding rate for the other race group at or beyond the 0.05 level.

decreased with increasing age. These same results were found in the 1993 and 1997 Prenatal Drug Prevalence Studies (3) using urine cotinine as a biomarker. Illegal drug use during pregnancy presented the same pattern as smoking with NH-Blacks showing increase usage with increasing age and NH-Whites showing the reverse. Similar patterns were also found in the 1993 and 1997 prenatal drug prevalence studies using urine biomarkers.[3]

Inconsistency with age was also evident with mother spacing of births of less than 18 months; with NH-Black mothers presenting lower rates than NH-White mothers prior to age 20 and higher rates for ages 20-39; with rates for 40 and over very similar. Cesarean section rates were lower for NH-Black mothers ages 18-24 than for NH-White mothers of the same ages. However, for ages 30-39 the reverse was noted with NH-Black cesarean section rates being higher.

Racial differences in percent of mothers with less than a high school education are very small for the teenage years but from ages 20-24 on the differences increase up to ages 30-34 and then level off with the NH-Black rate being around 2.5 times greater than the corresponding NH-White rate. For both groups the percent with less than a high school education decreases up to ages 30-34 and then increases slightly. The percent of mothers on Medicaid was very similar for NH-Black and NH-White teenagers. Medicaid participation decreased for both groups with increasing age up to 35-39 and

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Table 3. Crude and Adjusted Race Preterm Prevalence Ratios by Mothers Age:
1995-2000 Missouri Resident Singleton Live Births Recorded in Missouri Non-Military]ospitals

Prevalence Ratio	Age of Mother							
	10 to 17	18 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 and over	All Ages
Crude Ratio	1.72	1.66	1.77	2.09	2.45	2.38	2.19	2.04
95% CL	1.60-1.84	1.59-1.80	1.70-1.84	1.99-2.19	2.32-2.59	2.20-2.57	1.88-2.54	1.99-2.08
Adjusted* Ratio	1.65	1.52	1.51	1.59	1.65	1.51	1.48	1.6
95% CL	1.50-1.82	1.40-1.66	1.43-1.60	1.48-1.70	1.52-1.80	1.35-1.70	1.16-1.89	1.55-1.65

Prevalence ratio = NH-Black Preterm Rate / NH-White Preterm Rate
95% CL - 95% Confidence Limits
*Individual logistic regression model for each age group adjusting for mother's race, birth order, underweight for height (BMI<19.8), no first trimester care, cesarean section, medical risk (see table 1), smoking during pregnancy, illegal drug use during pregnancy, education less than 12 years, male gender, not married, Medicaid participant during pregnancy, spacing less than 18 months between births and all ages group adjusted for age.

then increased slightly. As with education, this decrease was more pronounced for NH-Whites (84.3%) than for NH-Blacks (51.5%).

Table 3 shows crude and adjusted relative risk (NH-Black/NH-White) in preterm births by mothers age for the study population. A marked increase in the crude NH-Black/NH-White preterm ratio was observed with increasing age. This was expected. As Table 2 shows, the profile of the two racial groups differ by age, with NH-Black mothers more likely to have characteristics related to poor pregnancy outcomes (e.g., high birth order, not married, low education level, short spacing between births, smoking and illegal drug use during pregnancy, no first trimester care and medical risk) than NH-White mothers for ages 30 and over, compared to the differences observed in the younger age groups.

Once one controls for confounding factors, the increase in the NH-Black/NH-White preterm ratios with increasing age was no longer evident. By far the most salient factor in the regression model, which reduced the NH-Black/NH-White preterm ratio, was medical factors, which increased substantially for NH-Blacks after ages 25-29. At age 40 and over, NH-Blacks had medical risk factors noted for three of every five pregnancies resulting in a live birth.

The foregoing points to a need for a broad-based approach to intervention. Currently Missouri has an educational campaign called "Baby Your Baby" which addresses some of the factors related to poor pregnancy outcomes. The multimedia campaign includes radio and television spots and printed material advocating the need for prenatal care and good health habits prior to and during pregnancy. Some medical risk factors are more evident in the later years of the fertility range (e.g., chronic hypertension, pregnancy-induced hypertension and insulin dependent diabetes) and are amenable to medical interventions and therefore should be positively influenced by prenatal care.

The results reported here should be viewed with some caution given the fact that there are other risk factors that are associated with preterm births and that some of the associations presented could very well be spurious. Some of the factors which prior research has found to be associated with preterm births were not included because of known poor reporting or they are just not available. These factors include: alcohol use, induced labor, bacterial vaginosis, sexually transmitted diseases, violence during pregnancy, stress, psychiatric/ emotional problems, prior spontaneous abortions.[4-6] Also, there is potential for bias in that the reviewed factors could be over/under reported depending on the outcome of the pregnancy.

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References:

1. Slattery M, Morrison J. Preterm delivery. The Lancet 2002; 360: 1489-1497.

2. Aveyard P, Cheng K, Manaseki S, Gardosi J. The risk of preterm delivery in women from different ethnic groups. Br J Obstet Gynaecol 2002; 109: 894-899.

3. Stockbauer J. Missouri 1997 Prenatal Drug Prevalence Study. Missouri Epidemiologist Jan-Feb 1999; 21: 1-6.

4. Ruiz R, Fullerton J, Brown C, Dudley D. Predicting Risk of Preterm Birth: The Roles of Stress, Clinical Risk Factors, and Corticotropin Releasing Hormone. Biological Research for Nursing 2002; 4: 54-64.

5. Mercer B, Goldenberg R, Moawad A. et al. The Preterm Prediction Study: Effect of gestational age and cause of preterm birth on subsequent obstetric outcome. Am J Obstet Gynecol 1999; 181: 1216-1221.

6. Andrews W, Goldenberg R, Mercer B. et al. The Preterm Prediction Study: Association of second-trimester genitourinary chlamydia infection with subsequent spontaneous preterm birth. Am J Obstet Gynecol 2000; 183:662-668.

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Provisional Vital Statistics for June 2002

Live births increased in June as 5,776 Missouri babies were born compared with 5,633 one year earlier. However, cumulative births for the 6– and 12– month periods ending with June both show decreases. For the first six months of the year, births decreased by 4.9 percent from 37,917 to 36,050.

Deaths increased in June as 4,386 Missourians died compared with 3,652 one year earlier. Cumulative deaths for the 6– and 12– month periods ending with June also show increases.

The **Natural increase** in June was 1,390 (5,776 births minus 4,386 deaths). The natural increase declined for all three time periods shown below.

Marriages also decreased for all three time periods shown in the table below.

Dissolutions of marriage increased in June, but decreased for the cumulative 6– and 12– month periods ending with June. The marriage to divorce ratio increased slightly from 1.78 to 1.79 for the 12 months ending with June.

Infant deaths increased for all three time periods shown below. For the 12 months ending with June, the infant death rate increased from 7.7 to 8.4 per 1,000 live births.

PROVISIONAL VITAL STATISTICS FOR JUNE 2002

Item	June				Jan.-Jun. cumulative				12 months ending with June				
	Number		Rate*		Number		Rate*		Number		Rate*		
	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002	2000	2001	2002
Live Births	5,633	5,776	13.0	12.0	37,917	36,050	13.7	12.8	76,130	73,662	13.8	13.6	13.0
Deaths	3,652	4,386	8.5	9.1	28,681	30,247	10.4	10.8	54,269	55,893	9.9	9.7	9.9
Natural increase	1,981	1,390	4.6	2.9	9,236	5,803	3.3	2.1	21,861	17,769	4.0	3.9	3.1
Marriages	5,765	5,482	13.3	11.4	20,379	19,685	7.4	7.0	43,126	41,392	8.0	7.7	7.3
Dissolutions	2,043	2,109	4.7	4.4	12,050	11,583	4.4	4.1	24,258	23,091	4.5	4.3	4.1
Infant deaths	38	50	4.2	3.7	335	351	8.8	9.7	586	620	7.7	7.7	8.4
Population base..... (in thousands)	...	...	5,630	5,665	...	...	5,630	5,665	...	...	5,571	5,613	5,648

* Rates for live births, deaths, natural increase, marriages and dissolutions are computed on the number per 1000 estimated population. The infant death rate is based on the number of infant deaths per 1000 live births. Rates are adjusted to account for varying lengths of monthly reporting periods.

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